ORDNANCE SURVEY GB

CODE-POINT® – GETTING STARTED GUIDE

Version history

Version	Date	Description
2.14	12/2014	Minor updates.
3.0	06/2022	Introduction of GeoPackage format to the product. Original combined User Guide and Technical Specification document split out into three separate documents: an Overview, a Technical Specification and a Getting Started Guide. Formatting updates to the document.

Purpose of this document

This document provides information about and insight into the Code-Point product and its potential applications. For information on the contents and structure of Code-Point, please refer to the Overview and Technical Specification.

The terms and conditions on which Code-Point is made available to you and your organisation are contained in that Ordnance Survey customer contract. Please ensure your organisation has signed a valid current customer contract to be able to use Code-Point.

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Contact details

OS website 'Contact us' page (https://www.ordnancesurvey.co.uk/contact-us).

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1.   Introduction to the product

Code-Point locates over 1.7 million postcode units for Great Britain and Northern Ireland, each having a notional geographical location. Postcodes are an alphanumeric abbreviated form of an address. Postcode units are unique references and identify an average of 15 addresses. In some cases, where an address receives a substantial amount of mail, a postcode will apply to only one address and is defined as a large-user postcode. The maximum number of addresses in a postcode is 100.
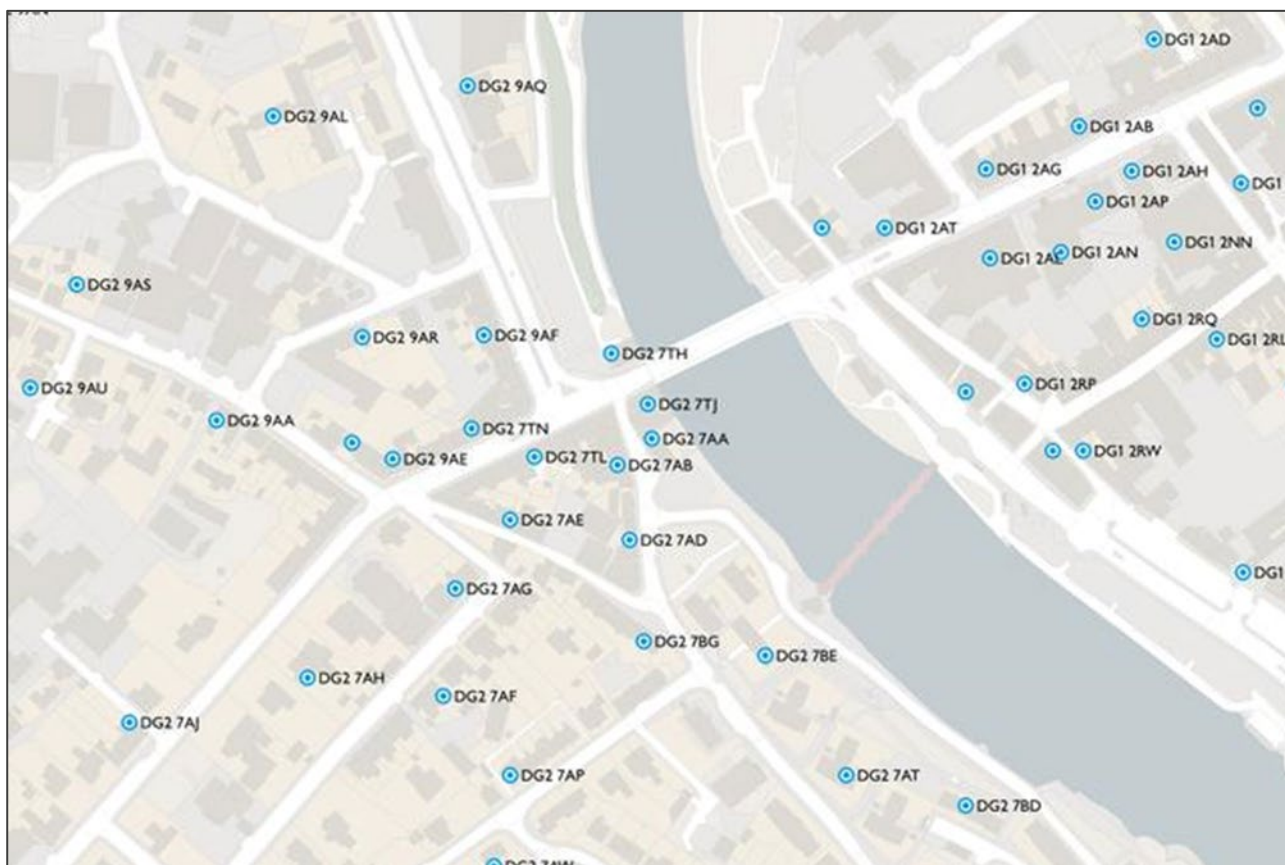
Figure 1:   Code-Point provides geographical locations for postcodes in Great Britain and Northern Ireland

This getting started guide focuses on using the product in comma-separated values (CSV) format. For guidance on using the product in GeoPackage format, please see the following getting started guide, which is available on the OS website: Getting Started with GeoPackage Guide (https://www.ordnancesurvey.co.uk/documents/getting-started-with-geopackage.pdf). Alternatively, more information about the National Transfer Format (NTF) can be found in the product's Technical Specification, which is available on the Code-Point Product Support page of the OS website (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

2.   Requirements for using the data

2.1   What you need to use Code-Point

Code-Point is a data product and does not include software for analysis but can be used with a variety of programs. Code-Point can be loaded into a GIS (geographical information system) for display and analysis of the data. Consult your GIS documentation to establish actual system requirements.

2.2   Supply mechanism

Code-Point is only available as national cover of Great Britain and Northern Ireland. The product is supplied in three formats (CSV, NTF, and GeoPackage) as an online download from the OS Data Hub (https://osdatahub.os.uk/). Alternatively, you can request a DVD of the product in CSV and NTF formats only from OS Orders (https://orders.ordnancesurvey.co.uk/sso/login.shtml).

Note: The GeoPackage format of the product is not available as a DVD supply option.

2.3   Product update schedule

Updates are supplied quarterly (February, May, August and November) and provided as a complete resupply. Any postcode that is deleted between supplies will not be included.

2.4   Coverage and file sizes

Code-Point covers postcodes for Great Britain and Northern Ireland. In CSV and NTF format, postcodes are divided into postcode areas and supplied as 121 files. GeoPackage format is a self-contained database.

The approximate file sizes of the respective data formats are as follows:

•   CSV: 198MB
•   NTF: 312MB
•   GeoPackage: 290MB

2.5   Code-Point data structure

2.5.1   CSV and NTF

There are two folders in the root directory: Doc and Data.

The Doc folder contains the following files:

•   CD_INFO.TXT – Note about the data on this DVD
•   Codelist.xls – Lookup table of GSS Codes

- NHS_Codelist.xls – Lookup table of Health GSS Codes
- metadata.txt – Number of postcode units in each postcode area
- Readfirst.txt – Summary of copyright, licence and data format information
- DISCCARE.TXT – Contains information on the care of DVDs

The Data folder contains the following sub-folders:

- CSV: 121 Postcode area files in CSV format
- NTF: 121 Postcode area files in NTF format

2.5.2 GeoPackage

There are two folders in the root directory: Doc and Data

The Doc folder contains the following files:

- Codelist.xls – Lookup table of GSS Codes
- metadata.txt – Number of postcode units in each postcode area
- NHS_Codelist.xls – Lookup table of Health GSS Codes
- Readfirst.txt – Summary of copyright, license and data format information

The Data folder contains the following file:

- UK_CODEPOINT.gpkg – one postcode area file in GeoPackage format

2.6 Available formats

2.6.1 CSV

The structure of Code-Point supplied in CSV is described in the product's Technical Specification, which is available on the [Code-Point Product Support page of the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support) (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

2.6.2 GeoPackage

The structure of Code-Point supplied in GeoPackage is described in the product's Technical Specification, which is available on the [Code-Point Product Support page of the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support) (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

2.6.3 NTF

Code-Point is supplied in NTF v2.0 level 2, which has been formally recognised as a British Standard: BS 7567. The structure of Code-Point supplied in NTF is described in the product's Technical Specification, which is available on the [Code-Point Product Support page of the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support) (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

3. CSV header file

The header file, required for use with the CSV format, can be downloaded from the [Code-Point Product Support page on the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support) (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

This header file contains two rows of data:

- Header codes
- Header descriptive names

4.   CSV file processing

As the Code-Point data is supplied in separate .csv files by 2-digit grid references, they will require some processing in order to proceed.

The Great Britain .csv files should be combined with the csv header file, and the Northern Ireland .csv file should be combined with the csv header file.

See CSV header file for more details and download information.

1. Before processing the data, create the following folders:

    •   Northern Ireland – move the BT.csv file into this folder

    •   Great Britain – contains all remaining .csv files for Great Britain (120 in total)

2. Add the CSV header file (code-point-column-headers.csv) into both folders and precede the name with aa_
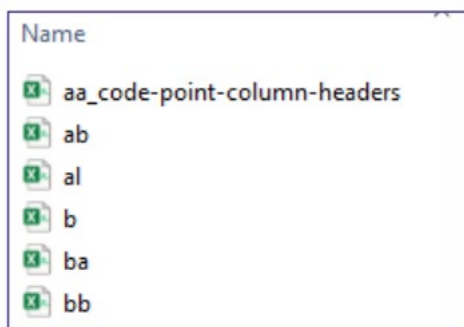
CSV header file and Great Britain .csv files
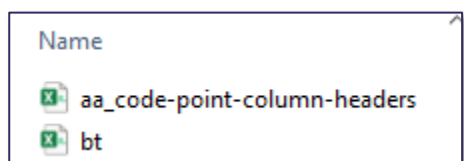
CSV header file and Northern Ireland .csv file

4.1   Combining multiple CSV files

The following is an example of one way to combine all the individual .csv files into a single file by using a .bat batch file.

Note: The .csv file that is created comes to approximately 150MB, and 1.7 million records. If this is opened in Microsoft Excel, only the first million records can be seen as the software cannot display more than this number of records.

To use the batch function:

1. Copy the following text and paste it into a new Notepad document: *.csv outputfile.csv

2. Save the Notepad document with the file extension .bat (e.g. combine_csv.bat) in the Great Britain folder containing the 120 Great Britain .csv files.

3. Close the .bat file and navigate to the Great Britain folder, where it was saved. Double click on the .bat file and an MS-DOS window will appear. Once the process is complete the MS-DOS screen will close automatically.

4. A new CSV file with the name outputfile.csv has now been created within the Great Britain folder

5. Repeat this process with the Northern Ireland data.

You will now have two output files ready for uploading into Geospatial Software (such as QGIS).

5. Creating single space postcodes for centroids

The aim of this section is to offer some guidance on how to process Code-Point data to generate postcodes with a single space.

Note: The NTF format is not included in this section as it is not compatible with a single-space format.

5.1 Outward and inward bound representation

The current specification represents the postcodes in a set format, which defines the postcodes as having an inward and outward 'code'. Code-Point postcodes have zero, one or two spaces between the inward and outward code.

The following table identifies how postcodes are currently shown in the data.

Postcode structure	Number of spaces
AANNNAA	Zero spaces (represented as AANNNAA), for example, PO143RW.
ANN NAA	One space (represented as ANN<>NAA), for example, CB1 1DG.
AN NAA	Two spaces (represented as AN<><>NAA), for example, B1 5AP.

5.2 Single-space postcodes

The Code-Point postcodes are currently represented as above; however, there may be a user requirement to represent each postcode in a uniform single-space format. Microsoft Excel and Microsoft Access formats have been included to provide guidance when using CSV format.

5.3 CSV single-space postcodes using Microsoft Excel and Access

1. Open the CSV file with Microsoft Excel so the data is displayed in columns.

2. In a new blank column, click in the first cell of the new column (excluding the row column names).

3. In the function line, enter in the following function command, where A1 is the column containing the postcode:

   =TRIM(LEFT(A1,LEN(A1)-3))&"<s>"&RIGHT(A1,3)

   Where <s> indicates a single space.

This should produce a column containing postcodes with a single space.

The same method can be employed in Microsoft Access, using an Update query rather than the function line. The functions listed above are the same for Microsoft Access and Microsoft Excel.

6.   Data measures

Ordnance Survey measures the data in its products in one or more of the ways set out in Table 1 below.

Table 1:   Definitions of data measures.

Data measure	Definition	Sub-measure	Definition
Completeness	Presence and absence of features against the specified data content[1]	Omission	Features representing objects that conform to the specified data content but are not present in the data.
		Commission	Features representing objects that do not conform to the specified data content but are present in the data.
Logical consistency	Degree of adherence to logical rules of data structure, attribution and relationships	Conceptual consistency	How closely the data follows the conceptual rules (or model).
		Domain consistency	How closely the data values in the dataset match the range of values in the dataset specification.
		Format consistency	The physical structure (syntax): how closely the data stored and delivered fits the database schema and agreed supply formats.
		Topological consistency	The explicit topological references between features (connectivity) – according to specification.
Positional accuracy	Accuracy of the position of features	Absolute accuracy	How closely the coordinates of a point in the dataset agree with the coordinates of the same point on the ground (in the British National Grid reference system).
		Relative accuracy	Positional consistency of a data point or feature in relation to other local data points or features within the same or another reference dataset.
		Geometric fidelity	The 'trueness' of features to the shapes and alignments of the objects they represent[1].
Temporal accuracy	Accuracy of temporal attributes and temporal relationships of features	Temporal consistency	How well-ordered events are recorded in the dataset (life cycles).
		Temporal validity (currency)	Validity of data with respect to time: the amount of real-world change that has been incorporated in the dataset that is scheduled for capture under current specifications.
Thematic accuracy (attribute accuracy)	Classification of features and their attributes	Classification correctness	How accurately the attributes within the dataset record the information about objects[1].

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[1] When testing the data according to the dataset specification against the 'real world' or reference dataset.

6.1   Metadata

Metadata, which is ISO 19115 UK GEMINI 2 compliant, can be found at
https://data.gov.uk/dataset/86d1f24d-dda6-49cf-921f-5e6c2417f879/code-point. Metadata .xml files can be
found at http://www.ordnancesurvey.co.uk/oswebsite/xml/products/.

Appendix A: Glossary

Glossary term	Definition
addressed premise	A permanent or non-permanent building structure with an address being a potential delivery point for Royal Mail. Examples of an addressed premise would be a house, a flat within a block of flats, a caravan site, a bollard to which several houseboats may be moored, or an organisation occupying the whole building.
building	A physical, walled structure connected to foundations that has, or will have, a roof. This definition includes buildings surveyed at foundation stage.
CPLC (Code-Point location coordinate)	A National Grid reference for each postcode unit. It is a two-dimensional coordinated point to a resolution of 1 metre. Coordinates are attributed from Gridlink using an accuracy hierarchy.
Country code	The code used by the Office of National Statistics to indicate the country in which the Code-Point georeference lies. This has replaced the PAF update date field.
Country Code	England E92000001 Scotland S92000003 Wales W92000004 N Ireland N92000002
Comma-separated values (CSV)	The CSV file format is commonly used to exchange data between different applications, for example, Microsoft Excel and Access. Being text files, CSV files can also be viewed in Notepad.
delivery point	A Royal Mail-defined point to which mail is delivered. This may be a property (private address), organisation, mailbox or even, very rarely, the name of an individual. These categories are derived from the Programmers' Guide from Royal Mail. This is distinct from the addressed premise because there may be more than one organisation at an address.
Gridlink	Gridlink is the name given to a joined-up Government initiative involving Royal Mail, the Office for National Statistics, National Records of Scotland (NRS), Land & Property Services and Ordnance Survey. All these organisations are involved in the georeferencing of postcodes and the relating of postcodes to administrative and National Health Service areas and so on.

Glossary term	Definition
inward code or incode	See postcode.
matched address	An address, resulting from a match between the OS MasterMap Topography Layer data and PAF, which has been allocated a coordinate position. The match may be a result of either manual or automatic matching, the latter encompassing both full and 'fuzzy logic' matching.
National Grid reference (NGref)	The National Grid provides a unique reference system that can be applied to all Ordnance Survey maps of Great Britain. The map of Great Britain is covered by 100 km by 100 km grid squares, with the origin lying to the west of the Isles of Scilly. When a National Grid reference is quoted, the easting (left to right direction) is always given before the northing (upwards direction). A National Grid reference (to 1 metre) will identify the spatial position of the CPLC.
non-geographic postcodes	Special non-geographic postcodes are allocated to single organisations who receive an exceptionally large amount of mail. These are included in Code-Point Open.
outward code or outcode	See postcode.
Postcode Address File (PAF)	PAF now contains the postal addresses and postcodes of approximately 28 million delivery points in Great Britain.
Postal Address Location Feed (PALF)	The PAL Feed is provided to Ordnance Survey from GeoPlace, who have geocoded the PAF feed from Royal Mail, using source coordinates from Local Authorities in England, Wales & Scotland and Ordnance Survey.
positional quality indicator (PQI)	The positional quality indicator is a flag used to indicate the positional accuracy of the coordinates allocated to each postcode record. There are seven PQI values for the positional quality of CPLCs.
postal address	A postal address is a delivery point that is currently receiving mail. There may be many delivery points within an individual building structure as shown in OS MasterMap Topography Layer data.
postcode	An abbreviated form of address made up of combinations of between five and seven alphanumeric characters. A postcode may cover between 1 and 100 addresses. The average number of addresses per postcode is 15.

Glossary term	Definition
postcode area	An area given a unique alphabetic coding by Royal Mail to facilitate the delivering of mail. The area is identified by one or two alpha characters at the start of the full postcode, the letters being derived from a town, city or district falling within the postcode area. There are, at present, 120 postcode areas in Great Britain, for example, SO for Southampton, MK for Milton Keynes, B for Birmingham or W for London West. The postcode area code constitutes the first part of the outward code.
postcode district	A sub-area of the postcode area, specified by the character sub-string within the first half of a full postcode, which may be numeric, alphabetic or alphanumeric; for example, 42 from MK42 6GH or 1A from W1A 4WW. There are approximately 2 986 postcode districts in Great Britain. *Note: there are certain non-geographic districts. In these instances, a district code is allocated to cover all large users in the postcode area.*
postcode sector	A sub-area of a postcode district, whose area is identified by the number third from the end of a full postcode. There are approximately 11 200 postcode sectors in Great Britain. An example of a postcode sector code is 3, from GU12 3DH.
postcode unit	A sub-area of a postcode sector, indicated by the two letters of the inward postcode, which identifies one or more small-user postcode delivery points or an individual large-user postcode. There are approximately 1.7 million postcode units in the UK.